

- 1. All equipment/materials and construction shall meet or exceed the requirements contained in the current Pima Association of Governments (PAG) "Standard Specifications for Public Improvements" and "Standard Details for Public Improvements", the Additional Contract Documents, the Special Provisions, and the plans.
- 2. The exact location of each new pole foundation, new pullbox, and electric service pedestal foundation shall be approved by the Engineer prior to installation.

#### UTILITIES

- 3. The location of Utilities shown on the plans is approximate. The contractor is responsible for potholing underground utilities in the vicinity of the proposed pole foundations. Utility potholing for pole foundations is incidental to the contract line items.
- 4. The contractor shall contact Blue Stake at 1-800-782-5348 a minimum of 48 hours prior to any excavation.
- 5. Pole foundations close to existing water mains, sewer lines and manholes, shall maintain a minimum of five (5) feet horizontal distance from the outside of foundation wall to the outside of the pipe wall. PCRWRD requires the Contractor to submit a WasteWater Flow Management Plan for new pole foundations that encroach the sewer impact zone. See the PCRWRD SSDC 2012, Section 2.2.1 for more information.
- 6. The contractor will be responsible for any damage to water, sewer, or dry utility facilities.

#### POLES AND SIGNALS

- 7. The Contractor shall remove and salvage existing poles, arms, and other equipment that will not be reused in the project to the COT Electric Shop. Call COT Electric Shop, 791—3154, for instructions, at least 48 hours in advance.
- 8. The Contractor shall ensure that the top of the finished pole foundation cap shall be flush with any adjacent sidewalk or edge of ramp. Tops of foundations away from sidewalks and ramps shall extend no more than 4 inches above surrounding finish grade.
- 9. All pedestrian push button assemblies shall be APS (audible vibrotactile type) pushbutton, Campbell Company AGPS 400 or approved equal and shall be mounted at 42 inches above finish grade to center of push button. Locations and accessibility of pushbuttons shall comply with requirements of the Americans with Disabilities Act (ADA). The signs to be used are identified in the 2009 MUTCD as R10-3e in Fig. 2B-26.
- 10. All signal indications shall be LED.
- 11. See Pole Schedule Notes on this sheet for additional requirements.

# CONDUIT AND PULLBOXES

- 12. Only new conduit shall be installed.
- 13. All conduit shall be installed a minimum of 30 inches below finished grade.
- 14. Any conduit installed shallower than 30 inches below finished grade shall be encased in concrete per Standard Specification No. 732-3.01(G).
- 15. All conduits shall be cleaned by compressed air and a properly sized conduit piston or mandrel prior to cable installation.
- 16. Conduit installed under existing pavement that is not scheduled to be reconstructed shall be installed by means of boring.
- 17. The costs of trenching for new traffic—signal conduit and patching to repair PCC or AC sidewalks, ramps, driveways, or other surfaces shall be considered incidental to the cost of conduit and shall not be paid separately.
- 18. Pull boxes shall not be installed within concrete curb access ramps, unless necessary and noted otherwise. In addition, any pull boxes installed behind curbs shall be installed between the curb and the proposed / future sidewalk or beyond the proposed / future sidewalk. An exception to this note would be pull boxes installed in a median. Any pull boxes installed along an uncurbed roadway shall be installed adjacent to, but not within, the shoulder.

# CITY OF TUCSON TRAFFIC SIGNAL GENERAL NOTES, continued

#### CONDUCTORS

- 19. Only new conductors and cables shall be installed.
- 20. The #14 AWG IMSA 19-1-1984 16- and 7-conductor solid wire cables shall be installed from the control cabinet to each signalized pole un-spliced with three feet of slack in each pull box. At each pole contractor will include enough cable to reach side mounted termination blocks for splicing IMSA cables. The outer jackets shall NOT be removed from cables at hand hole. Conductors SHALL be terminated as needed in mountings or as directed by the engineer.
- 21. Two XHHW conductors shall be installed from each luminaire to the concrete pull box adjacent to the pole foundation, leaving three feet of slack for each conductor (measured from the top of the pull box) in the pull box. A 5-amp in-line LP-CC-5 low-peak Class CC fuse shall be installed for each luminaire in the associated pull box. Fuse holders shall be Cooper-Bussman HEB-AA. A third conductor will be installed to poles on which an illuminated sign will be mounted,
- 22. Poles with pedestrian signals and APS (Accessible Pedestrian Station) pushbuttons and without vehicle signals shall use one 7—conductor cable for both the APS pushbutton and the pedestrian signal unless noted otherwise. The outer cable jacket shall NOT be removed at the hand hole height. Four conductors shall be routed to the APS pushbutton and the remaining conductors shall be routed to the pedestrian signal.
- 23. Poles with BIKES WAIT / BIKES OK signs and pushbuttons for cyclists shall use one 7—conductor cable for both the pushbutton and the sign, unless noted otherwise. The outer cable jacket shall NOT be removed at the hand hole height. Two conductors shall be routed to the pushbutton and the remaining conductors shall be routed to the bike sign.
- 24. See Conduit and Conductor Schedule Notes on this sheet for additional requirements.

#### LUMINAIRES

25. The luminaire to be used on HAWK poles shall be the American Electric Lighting Autobahn ATBM luminaire that is similar to existing luminaires on adjacent signal poles or street light poles and that is compatible with the available electrical service. Each luminaire on HAWK poles shall have R3 distribution, 3000K Correlated Color Temperature, P7 7—pin Photocell Receptacle option, ROAM adaptive control, Acuity SPD surge protector with LED indication, and a 10—year warranty. The Contractor shall contact the City of Tucson a minimum of three weeks prior to ordering to verify the type of luminaire that the City of Tucson will want to have installed.

# <u>RESPONSIBILITIES</u>

- 1. The Contractor shall supply and install the following equipment and materials as specified on the plans: steel pole anchor bolts (with nuts and washers), concrete pole foundations with reinforcement (where specified), concrete pull boxes, electrical conduit, ground rods and connectors, bare bond wire and all other conductors, traffic signals and mounting assemblies, pedestrian signals and mounting assemblies, pedestrian push button stations with signs, luminaires, photo cells, electric service pedestal and concrete foundation, and all other appurtenances necessary for the operation of the traffic signal installation, except as noted otherwise or modified in the plans.
- 2. TDOT shall supply the traffic signal controller cabinet, controller, and video detection systems.
- 3. The Contractor shall install the traffic controller cabinet on its foundation and route all of the conductors into the control cabinet. TDOT staff shall terminate the conductors in the control cabinet.

#### EXCAVATOR'S RESPONSIBILITIES

In accordance with Southwest Gas Corporation's operation guidelines on file with the State of Arizona, the following procedure has been implemented. This procedure was created to help ensure the excavating industry and the general public's safety by providing a positive identification of Southwest Gas (SWG) facilities that could be in conflict with a directional boring excavation or an excavation project that may require an excavator to cross a high-pressure gas facility.

At the time a line location is completed and it is identified as being in conflict with high-pressure gas facilities, or the line location request indicates boring is required; the SWG representative will notify the excavator of the following requirements.

HIGH PRESSURE OR 6-INCH & ABOVE DISTRIBUTION MAIN

- 1. If the excavation will cross or be in conflict with a Southwest Gas underground facility (within 10' of the HP gas facility) the excavator will call Southwest Gas to schedule a standby 24 hours prior to the excavation. Phone # (520)-794-6021. Requestor will also notify all subcontractors listed on the Blue Stake request of the excavator's responsibilities.
- 2. Prior to the scheduled standby the gas facility should be potholed and exposed in a careful and prudent manner as required by Arizona State Law (40-360.22) 2' on all sides of the facility for a positive identification, and to ensure proper required separation of all underground facilities.
- 3. The SWG representative will make positive identification of the underground facility. The SWG representative will observe the excavation operation for the duration of the operation or until it had been determined that the equipment will no longer be in conflict or pose possible hazard to Southwest Gas facilities or the excavator/general public.
- 4. The SWG representative will inspect the condition of the gas facility at the time of the excavation completion to ensure no damage to the gas facility has occurred as a result of the potholing or boring operations. As required by Arizona State Law (40–360.21) it is the excavator's responsibility to protect and support facilities. In the event there is damage to the facility, it is the responsibility of the excavator and the SWG representative to notify emergency resources, 911, and SWG (800)–722–4277 for repairs to the facility.

| Record Document |
|-----------------|
| Dated: / /      |

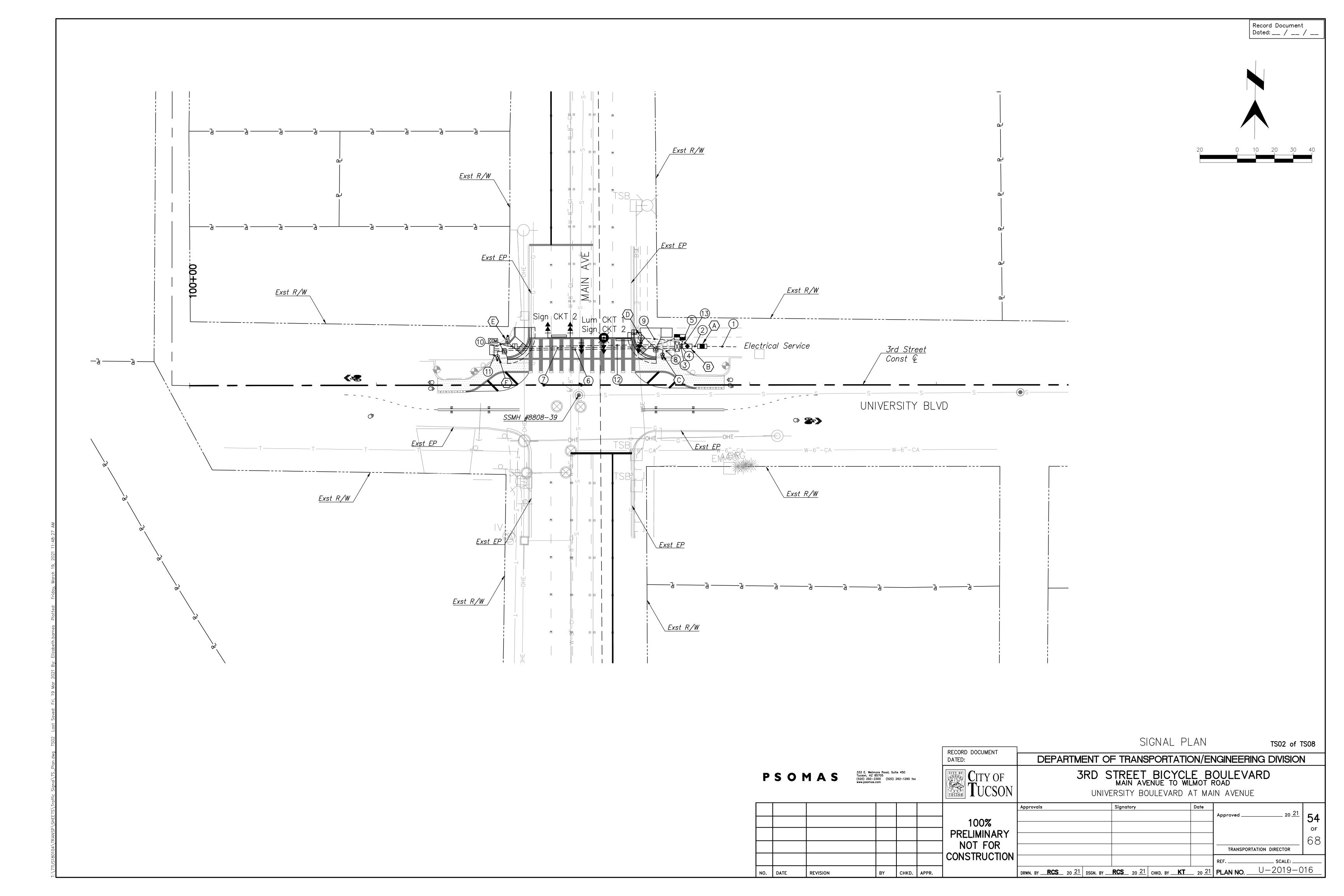
|                 |                     | Traffic Signal Equipment Legend          |
|-----------------|---------------------|--|
| Exst            | New                 |  |
|                 |                     | Meter Pedestal                           |
|                 |                     | Uninterruptible Power Supply             |
|                 | •                   | Controller                               |
|                 | M                   | #7 Pullbox with Extension                |
|                 |                     | #7 Pullbox                               |
| $\Diamond$      | <b>\$</b>           | #3 1/2 Pullbox                           |
|                 |                     | Underground Conduit                      |
|                 | (5)                 | Signal Conduit / Conductor Run #         |
| 6               | 0                   | Signal or Light Pole and Foundation      |
|                 | $\langle A \rangle$ | Pole or Cabinet Keynote                  |
|                 | <b>+</b>            | Flasher Head — Type F (mod)              |
|                 | —                   | Illuminated Sign for Bicyclists          |
|                 | ۳                   | Pedestrian Signal Head                   |
|                 |                     | Pedestrian or Bicycle Pushbutton         |
| $\vec{\lambda}$ | Ø                   | Luminaire                                |
|                 | Ø                   | Luminaire with Photocell                 |
|                 | CKTx                | Lighting Circuit Number for Signal Poles |
|                 |                     | Illuminated Crossing Sign                |
|                 | СОМ                 | #9 Pullbox                               |
|                 |                     |  |

| Road            | Posted speed (mph) |
|-----------------|--------------------|
| Wilmot Road     | 40                 |
| Craycroft Road  | 40                 |
| Rosewood Street | 25                 |
| University Blvd | 25                 |
| Main Ave        | 30                 |

TRAFFIC SIGNAL GENERAL NOTES AND LEGEND

TS01 of TS08

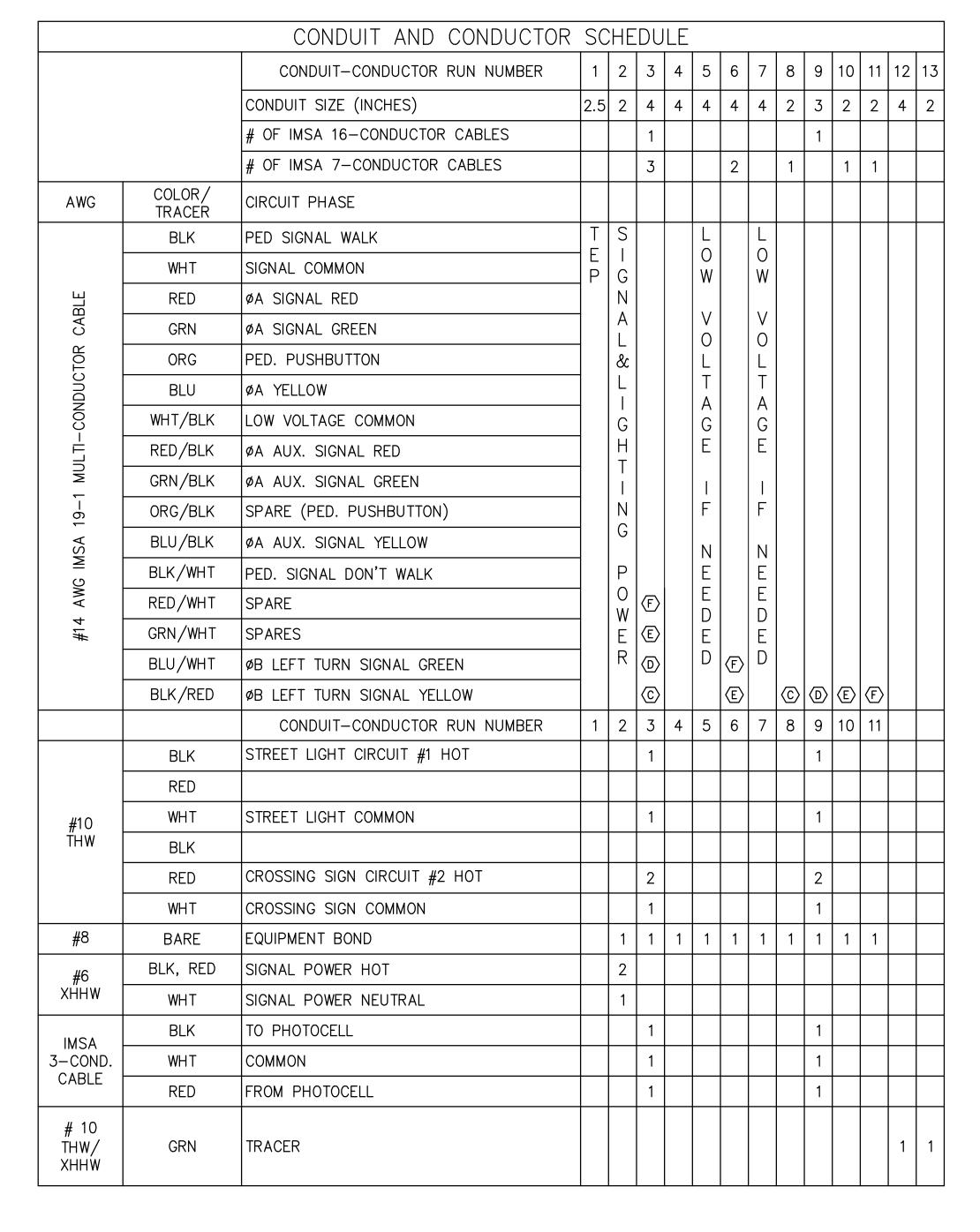
|     |      |          |  |                                     |                 |       | RECORD DOCUMENT<br>DATED: | DEPARTMENT C                         | OF TRANSPORTATION                                      | ON/EI | NGINEERING DIVISION     | V   |
|-----|------|----------|--|-------------------------------------|-----------------|-------|---------------------------|--------------------------------------|--|-------|-------------------------|-----|
| P   | S O  | MAS      | 333 E. Wetmore R<br>Tucson, AZ 85705<br>(520) 292-2300<br>www.psomas.com | Road, Suite 450<br>5<br>(520) 292-1 | 50<br>-1290 fax |       | CITY OF TUCSON            | 3RD S                                | STREET BICYCL<br>MAIN AVENUE TO WI<br>Traffic Signal F |       | OULEVARD                |     |
|     |      |          |  |                                     |                 |       |                           | Approvals                            | Signatory  | Date  |                         |     |
|     |      |          |  |                                     |                 |       | 4000                      |                                      |  |       | Approved                | 53  |
|     |      |          |  |                                     |                 |       | 100%                      |                                      |  |       |                         | OF  |
|     |      |          |  |                                     |                 |       | PRELIMINARY               |                                      |  |       | ·                       |     |
|     |      |          |  |                                     |                 |       | NOT FOR                   |                                      |  |       |                         | 68  |
|     |      |          |  |                                     |                 |       | 1                         |                                      |  |       | TRANSPORTATION DIRECTOR |     |
|     |      |          |  |                                     |                 |       | CONSTRUCTION              |                                      |  |       | REF SCALE:              |     |
| NO. | DATE | REVISION | B  | Y CH                                | HKD.            | APPR. | 1                         | DRWN. BY <b>RCS</b> 20 21 DSGN. BY _ | RCS 20 21 CHKD. BY KT                                  | 20_21 | PLAN NO. U-2019-0       | 016 |



|              |          |                          |                                     |                    | CABIN  | ET AND                                 | POLE                              | SCHED                                       | ULE  |                   |                         |                         |
|--------------|----------|--------------------------|-------------------------------------|--------------------|--|--|-----------------------------------|---|--|-------------------|-------------------------|-------------------------|
| CABINET TYPE |          | TYPE                     | CONTROLLER                          |                    |  | AUX CONTROLLER                         |                                   | FOUN—<br>DATION                             |  | LOCA TION         |                         |                         |
| A            |          | METER PEDESTAL<br>T 1801 | MYERS MODEL<br>MEUG-Q-M<br>100 C-UM |                    |  | 125A 120/240V                          |                                   | T 1801                                      | INSTALL CIRCUIT BREAKERS: (1) 60A/2P: SIGNAL (2) 20A/1P: LUMINAIRES (2) 20A/1P: CROSSING SIGNS |                   |                         | 102+75±<br>26'± Lt      |
| B            | B        |                          |                                     | TS-2<br>T SUPPLIEL |  | _                                      |                                   | TO FIT<br>CABINET                           | CABINET AND CONTROLLER SUPPLIED BY CITY,<br>INSTALLED BY CONTRACTOR.                           |                   |                         | 102+67±<br>26'± Lt      |
|              |          | POLE                     |                                     | MAST               | ARMS   | SIGNALS                                |                                   |   | & BIKE<br>HBUTTON  | LUMINAIRE         | REMARKS                 | STATION,<br>OFFSET,     |
|              | NUMBER   |                          | TYPE                                | SIGNAL             | LUMIN  | . MTG                                  | FACE                              | l l   | PE/SIGN  | LOWINAINL         | NEWANNS                 | ELEVATION               |
| (C)          | ⟨C⟩<br>□ |                          |                                     | _                  | _  | (1) XI<br>T 909                        | (1) BIKE<br>SEE SHEE<br>TS8 DETAI | 7 2" AI<br>SIG                              | TYPE 1<br>DA T 1101<br>N R9—5<br>OTE 10  | _                 | _                       | 102+53.37,<br>21.43' Lt |
|              |          | CCTV–R<br>T 413          | 50'                                 | 20'                | (4) II<br>T 901<br>(1) V<br>T 903<br>(1) XI<br>T 909 | (5) F MOL<br>T 801<br>(1) PED<br>T 804 | 2" A                              | TYPE 1<br>DA T 1101<br>R10-3e (L)<br>VOTE 9 | SEE NOTE 7   | SIGN: SEE NOTE 11 | 102+41.91,<br>30.49' Lt |                         |
| E            | ٷؚ       |                          | A<br>10'<br>T 401                   | _                  | _  | (1) XI<br>T 909                        | (1) PED<br>T 804                  | 2" A  | TYPE 1<br>DA T 1101<br>R10-3e (L)<br>VOTE 9  | _                 | _                       | 101+70.49,<br>28.81' Lt |
| F            | ē        | <b>-</b>   <b>⊡</b>      | A<br>10'<br>T 401                   | _                  | _  | (1) XI<br>T 909                        | (1) BIKE<br>SEE SHEE<br>TS8 DETAI | 7 2" AI<br>SIG                              | TYPE 1<br>DA T 1101<br>N R9—5<br>OTE 10  | _                 | _                       | 101+64.94,<br>20.53' Lt |

### CONDUIT AND CONDUCTOR SCHEDULE GENERAL NOTES

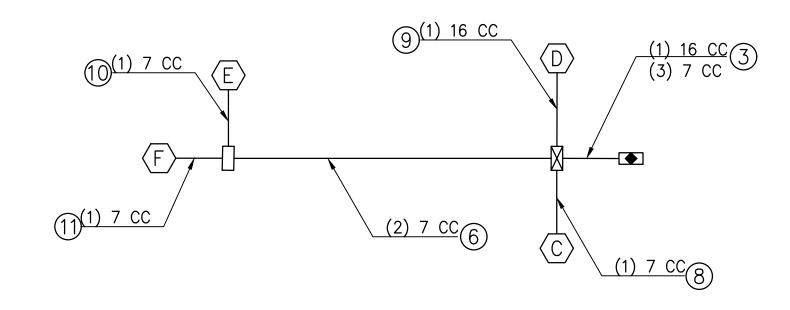
- 1. An 18-gauge 4-conductor shielded cable shall be run unspliced from each pedestrian station to the nearest pedestrian head associated with the pedestrian station's phase.
- 2. The IMSA 16-conductor and 7-conductor cables shall be continuous and unspliced from the controller cabinet to the side-mounted signal terminal block on the pole. The mast arms' 7-conductor cables shall then run from each signal head to the terminal block. All pole signal head splicing shall occur solely at the terminal block.
- 3. A crimp connection shall be used for splicing lighting common (white) and insulated bond (green) or bare bond conductors in pull boxes.
- 4. Lighting wiring from controller to pullboxes shall be type THW. Lighting wiring from pullboxes to luminaires shall be type XHHW.



### CABINET AND POLE SCHEDULE NOTES

- 1. The Contractor shall have the site Blue Staked prior to beginning any excavation work. If clearances of less than 5' from underground lines are discovered, Contractor shall pothole to verify the exact clearance.
- 2. All equipment, materials, and construction shall meet or exceed the current PAG "Standard Specifications for Public Improvements" and "Standard Details for Public Improvements."
- 3. The Contractor shall pick up the traffic signal control cabinet from the City of Tucson after testing. Contact Roger Kestler at 520-837-6805 for details.
- 4. Power cables shall be separated from signal cables as much as possible.
- 5. All signal heads on mast arms shall be metal.
- 6. All signal indications shall be LED. Pedestrian signals shall be countdown style.
- 7. Luminaires shall have 7—pin photocell receptacles and ROAM nodes.
- 8. Pedestrian push buttons shall be audible vibrotactile Campbell AGPS or equal. Bicycle push buttons shall be piezo electric, non-moving discharge Campbell 4—EVR or equal. All push buttons shall be mounted at 42 inches above finish grade to center of push button. Locations and accessibility of push buttons shall comply with requirements of the Americans with Disabilities Act (ADA).

- 9. Furnish and install pedestrian push button sign R10—3e as shown in Figure 2B—26 in section 2B.51 of the 2009 MUTCD.
- 10. Furnish and install bicycle pushbutton sign R9-5 (9" x 12").
- 11. Metro crosswalk sign for northbound traffic to be suspended from flag pole mount, minimum 17' vertical clearance. Metro crosswalk sign for southbound traffic to be suspended from signal arm, minimum 17' vertical clearance.
- 12. The meter pedestal shall comply with TEP Electrical Service Requirement SR-409 and SR-452.
- 13. The Contractor see Special Provisions for service requirement.
- 14. All new pole foundations shall be flush with adjacent new/exst ramp or ramp curb, which ever is applicable.



# MULTI-CONDUCTOR SIGNAL CABLE DIAGRAM

CABINET & POLE SCHEDULE CONDUIT & CONDUCTOR SCHEDULE TS03 of TS08 RECORD DOCUMENT DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION 3RD STREET BICYCLE BOULEVARD
MAIN AVENUE TO WILMOT ROAD CITY OF PSOMAS

333 E. Wetmore Road, Suite 450
Tucson, AZ 85705
(520) 292–2300 (520) 292–1290 fax
www.psomas.com TUCSON UNIVERSITY BOULEVARD AT MAIN AVENUE Approvals Signatory 100% OF **PRELIMINARY** NOT FOR TRANSPORTATION DIRECTOR CONSTRUCTION \_ SCALE: \_ DRWN. BY \_\_RCS \_\_ 20 \_21 | DSGN. BY \_\_RCS \_\_ 20 \_21 | CHKD. BY \_\_KT \_\_ 20 \_21 | PLAN NO. \_\_ U-2019-016 NO. DATE BY CHKD. APPR. REVISION

